SCIS, moreover, develops the material investments of switching components based on dynamic and forward-looking engineering design characteristics. It is updated periodically to incorporate new vendor designs, peripherals, generics and price lists.

SCIS reflects the reality that Verizon VA has and will continue to gradually replace *all* parts of the switch. A replacement discount is only appropriate when Verizon VA purchases an entire new switch. In reality, Verizon VA constantly is engaged in upgrades and modifications to existing switches, which allow Verizon VA to expand its switching network without frequently buying new switches.

The SCIS model is discussed in more detail in the surrebuttal testimony of David Garfield, who is currently employed by Telcordia.

Q. Does the letter from Telcordia to Verizon MA, dated July 30, 2001, support AT&T/WorldCom's point that SCIS reflects the cost to purchase a new switch? [AT&T/WorldCom Rebuttal Panel at 102 n. 73.]

A. AT&T/WorldCom have taken Telcordia's letter out of context, as Mr. Garfield explains in his testimony.

Q. Why is it appropriate to apply Verizon VA's mix of discounts (new and growth) to all switch equipment, including "getting started" equipment, not just the add-on equipment? [AT&T/WorldCom Rebuttal Panel at 99, 102.]

A. AT&T/WorldCom's argument is based on the incorrect premise that Verizon VA will ***always*** receive the new switch discount when it purchases components associated with "getting started" costs — such as processors. It may be true that each switch comes with a processor. However, it is Verizon VA's experience that switch processors are replaced, as are other components of the switch, without purchasing an entire new switch. Switch processors are replaced for many reasons, including the need to provide additional capacity to meet regulatory mandates, such as for LNP and two-pick capability, that are driven by call processing requirements.

Thus, AT&T/WorldCom simply ignore the fact that over the long run, Verizon VA replaces virtually all parts of the switch, including the equipment included in the "getting started" equipment, *i.e.*, the processor and memory. Verizon does not receive the new switch discount when these components are purchased.

The following are examples of switch components that have been grown or replaced, without purchasing a new switch:

- **Administrative Module (5ESS)** — Hardware upgrades (memory) to the Administrative Module (AM) have been required with every Software Release. There have been multiple offices where the AM — model 3B20 processor needed replacement with a 3B21 model for load relief. With the 5E14 generic release, the 3B20 to 3B21 processor replacement is required in all offices to provide capacity for increased memory requirements. With 5E13, the Administrative Services Module was introduced, which is an architectural improvement over the AM. In order to offload much of the work performed by the AM, a DLN30 was added to offices in Virginia including Brickell Road (5/00) and Jefferson Avenue (9/01).

- The **Communications Module (CM) (5ESS)** has evolved from CM-1 to CM-2. The CM-2 is required with 5E14. Additional CM bays are being installed at a rapid rate. Two CM2 growth bays were added in each of the following offices in 2001 in Virginia: Luck Avenue (1/01), Chester (1/01), Cogbill (1/01), Gaskins (2/01), Grace Street (4/01), Mechanicsville (3/01), Midlothian (2/01), Stuart (2/01) and Turner Road (3/01).

- **Recorded Announcement System (5ESS)** — The 13A analog broadcast announcement units were manufacturer discontinued in 1995. The replacement 16A digital announcer provides for an increase in announcement capability utilizing digital trunk access. The following are examples of offices where a 16A announcement frames were added: Stephens City (11/00), Mechanicsville (3/01) and Clearview (6/01).

- **Maintenance and Test equipment (5ESS)** — New test sets have been required to test new services. The Operations, Administration and Maintenance software was enhanced with 5E7. TBCU's were added to many Virginia offices to provide additional test capabilities. These sites include: McKenney (4/01), Pemberton (4/00) and Churchland Road (4/01). Furthermore, in some instances, SM500 circuit packs need to be added to a TBCU. Offices where this occurred in Virginia include Ashland (3/01), Sandston (2/00) and Virginia Beach 32nd Street (5/01).

- **Quad Link Packet Switch (5ESS)** — This was an enhancement to the CM-2 architecture that was introduced in 5E9.2. The Quad Link Packet Switch (QLPS) is being installed when the first Switch Module (SM) 2000 is added to the office.

Verizon is continuing to incur expense associated with provisioning the QLPS in conjunction with growing SM2000 in the network.

- **Gateway Processor (5ESS)** — The Gateway Processor interfaces with the AM and classic SMs. It also interfaces with the QLPS for SM-2000 communications. Verizon is currently adding Gateway Processors in conjunction with the QLPS when the first SM-2000 is added to an office. Examples of where the QLPS and gateway processor were required include locations: Clearview (6/01), Culpeper (11/00), Midlothian (2/01), Bute Street (9/00) and Aberdeen Road (6/01).

- **Core Cabinet with Message Switch (DMS-100)** — The gating hardware for the Message Switch was 7MB minimum for generic NA003. With NA004, the minimum requirement increased to 16MB. With generic NA007 and NA008, message switch memory was increased to 24 MB. Offices require NA007 for Local Number Portability and NA008 for year 2000 compliance.

- **Computing Module (DMS-100)** — Supernode (SN) 50 was required to load NA006. Effective with NA007, NT40 is no longer supported and SN60 processors are required with increased memory requirements of 96M cards. Upgrade of the memory cards from 24M to 96M requires a minimum of four 96M cards per side for a total of eight 96M cards per Computing Module. This requirement has increased to five cards per side or ten 96M card per Computing Module with generic NA0010.

- **System Load Module (DMS-100)** — With NA003, System Load Module (SLM) II were required for SN offices and SLM1A were required with SNSE offices. With NA006, SNSE offices required 9X44AD SLM III. Effective with NA008, SLM IIIs are required for all SN offices of greater than 95K lines. Effective with NA010, SLMIII are required in all offices.

- The **Nortel processor** evolution will migrate from SN70 to XA Core. With the XA-Core upgrade, the existing processor, memory and system load modules of the DMS supernode will be replaced.

- **Input/Output Equipment (DMS-100)** — The Input/Output controller was discontinued on 2/28/00. The replacement hardware is the Integrated Services Module (ISM). Verizon was required to upgrade to the ISM in various locations as

additional input/output ports have been needed for additional SMDI, SMDR and voice messaging links.

- **Maintenance and Test Equipment (DMS-100)** — The Line Test Unit (LTU) has been replaced by the Metallic Test Unit (MTU) to provide increased capacity. Nortel documentation states that this feature is in the process of evolution with enhancements to be provided in the near future.

- **Front End Processor (Siemens)** —The 113C front end processor is Siemens latest generation hardware, providing faster call processing. Chinese Corner was upgraded to a 113C front end processor in March 2001 to handle the call volumes originally expected to be carried using the 113A processor.

- **Switching Network (Siemens)** — The Switching Network (SN) determines how many Line Trunk Groups can be terminated into the switching network. Huntington, Virginia is currently scheduled to upgrade from SN 5.1 to SN 5.4 to allow for additional line and trunk terminations.

- **Call Processors (CAPS) (Siemens)** — The CAPS enhance and increase the speed and processing capacity of the front end processor. Additional CAPS have been required based on office load. The following Virginia offices had additional CAPS installed: Chinese Corners (8/00), Deep Creek (4/01), Drummonds Corner (4/01), Harpersville (10/00), Huntington (10/00), Indian Lakes (4/01), Mount Vernon (10/00), Springfield (5/01) and Suffolk (10/00).

Q. Please explain what drives these types of upgrades.

A. The majority of these upgrades are generated by the vendors themselves. For example, Attachment Q outlines the upgrades associated with Nortel's DMS-100 and Lucent's 5ESS technology. Similar upgrades are required by Siemens' EWSD technology.

The Commission has recognized that vendors will provide deep discounts on a new switch so that they can lock a company into

purchasing numerous upgrades and so forth at higher prices. Last year, the D.C. Circuit Court of Appeals agreed with the Commission's assertion that "growth additions to existing switches cost more than new switches only because vendors offer substantial new switch discounts in order to make telephone companies dependent on the vendors' technology to update the switches."[148/]

In short, it is appropriate to apply Verizon VA's mix of discounts to all switch equipment, because that is the way Verizon is billed for the equipment and will be billed on a going-forward basis.

Q. Please respond to AT&T/WorldCom's claims that all lines and trunks should receive a new switch discount. [AT&T/WorldCom Rebuttal Panel at 102.]

A. AT&T/WorldCom again misstate the facts. Verizon VA adds lines and trunks over time, not just when it purchases a new switch. Lines and trunks added over time would not receive the new switch discount.

The effective discount Verizon VA used in its cost studies appropriately reflects a mix of lines and trunks purchased with a new switch, and lines and trunks added over time.

148/ *AT&T Corp. v. FCC*, 220 F.3d 607, 618 (D.C. Cir 2000).

B. VERIZON VA ASSUMES AN APPROPRIATE FORWARD-LOOKING TECHNOLOGY MIX

Q. Please explain how the technology mix of IDLC (GR-303 and TR-008) and copper affects switching costs.

A. The technology mix impacts the type, quantity, and prices of switch ports to be used in the switching cost study.

Q. What mix of IDLC versus copper did Verizon VA assume in its switching cost study?

A. Verizon VA assumed 57.6% IDLC ports and 42.4% analog ports in its cost studies.

Q. Do you agree with AT&T/WorldCom's claim that the percentage of GR-303 IDLC in Verizon VA's UNE switching studies should be 82%? [AT&T/WorldCom Rebuttal Panel at 106.]

A. No. Verizon VA's switching network must be configured in a manner necessary to serve the demands of the end user, and is directly tied to the design of the outside plant loops. Many of the reasons why 10% GR-303 IDLC and 47.6% TR-008 IDLC were used in Verizon VA's cost studies have been already addressed in the loop section of this testimony. Any suggestion that Verizon VA could serve 82% of its access lines on integrated DLC is simply absurd. Analog line units are necessary in the switch to serve customers who are being served on either UDLC or copper loops. IDLC is only practical in locations where customers can be served

from remote terminals in, at minimum, groupings of 96 lines. Otherwise, switching resources are wasted, and costs increase. In Virginia's many rural areas, such groupings of customers in any given location simply do not exist. The switch design Verizon VA proposes in its study is designed to meet the actual customer demand throughout the diverse state of Virginia, not an arbitrary clustering of all customers located ideally around Verizon VA's remote terminals. AT&T/WorldCom's proposal that Verizon VA serve 82% of its access lines on integrated GR-303 is simply unrealistic and should be rejected.

Q. What is Verizon VA's actual deployment of IDLC?

A. As of January 1, 2001, only 23% of Verizon VA's access lines are integrated into the switch using TR-008 technology. There are virtually no lines integrated using GR-303 technology.

Q. Do you agree with AT&T/WorldCom's claim that all of the IDLC technology assumed in a cost study should reflect GR-303, rather than TR-008? [AT&T/WorldCom Rebuttal Panel at 106.]

A. No. As shown in the network planning guidelines provided by Verizon VA to AT&T/WorldCom in response to interrogatory AT&T 9-38, Verizon VA is now buying exclusively TR-008 equipment, not GR-303. Indeed, Verizon VA has no GR-303 technology in its network today and, at this time, has no plans to install GR-303 in its network.

Furthermore, the only applications of GR-303 technology deployed in the entire Verizon – East footprint have been used wholly on a limited trial application basis.[149/] These trial applications have yielded a result of less than 0.07 percent of the total working loops in Verizon – East that are currently served via GR-303 technology. Thus, Verizon VA's assumption of 10% GR-303 equipment is very generous to AT&T/WorldCom.

Q. Do you agree with AT&T/WorldCom's claim that the existence of an analog switch in Verizon VA's Purcellville wire center, which would require UDLC as opposed to IDLC, demonstrates that Verizon VA inappropriately relies on its embedded network? [AT&T/WorldCom Rebuttal Panel at 22-23.]

A. No. AT&T/WorldCom wrongly state that there is an analog switch in Verizon VA's Purcellville wire center. As Verizon VA explained in response to interrogatory AT&T 9-53, the Purcellville wire center has a digital remote switch, not an analog switch.

[149/] GR-303 technology in Verizon VA requires the Operation Support System (OSS) software Digital Loop Electronics/System Activation (DLE/SA) process that allows mechanized system activation and provisioning with the associated legacy OSS. There is no work-around for this process. Furthermore, methods and procedures, training development and training for GR-303, and work force additions required to meet both OSS new work processes and Operations Facility Management Center (FMC) / Network Operations / Administration Center (NOC/NAC) are also required for implementation.

Q. Does Verizon VA's switching study overstate the costs of GR-303 by assuming unreasonably high usage in the GR-303 lines in SCIS, as AT&T/WorldCom contend? [AT&T/WorldCom Rebuttal Panel at 106-07.]

A. No. The usage data used in Verizon VA's cost studies was developed from actual design data on digital (integrated) lines. Usage on digital lines is higher than usage on analog lines because IDLC is more likely placed in locations where there are a high number of customers concentrated in close proximity to each other. Naturally, these types of locations tend to have a high proportion of business users, who generally drive higher busy hour usage. In addition, higher-usage-residential customers tend to be concentrated together in locations such as college campuses or downtown residential apartment buildings.

Q. Please comment on AT&T/WorldCom's claim that a 4:1 line concentration for GR-303 should be assumed, rather than Verizon VA's assumed 3:1 line concentration ratio. [AT&T/WorldCom Rebuttal Panel at 10-31, 106.]

A. Verizon VA appropriately reflects line concentration for its GR-303 assumptions. Line concentration permits the assignment of a greater number (in excess of twenty-four) of 2-Wire Analog (DS0) channels to a DS1 transport channel. Without concentration, one DS1 handles a maximum of 24 DS0s.

For example, a 3:1 line concentration allows 72 (24 x 3) voice-grade or 2-wire analog loops to be assigned to a single DS1 transport channel, which is directly terminated into the digital switch. Using a GR-303 interface, a DLC system can concentrate traffic in its remote terminal ("RT") before transporting it to the switch. In this manner, a carrier using GR-303 concentration technology can reduce the total number of DS1 facilities (and therefore digital switch port terminations) required between the RT and the digital switch.

Line concentration is feasible because statistically, all customers served from a particular DLC remote terminal are not requesting service at the same time. Thus, Verizon VA assumed in its cost study that no more than a third of its customers served by a GR-303 remote terminal will use their phones simultaneously. This, in turn, affects the number of switching ports assumed in the cost study.

Verizon VA has proposed a 3:1 remote terminal line concentration ratio based on the judgment and experience of its network engineers. Increased dial-up internet connections and holding times have contributed to Verizon VA's determination that a ratio no higher than 3:1 is appropriate. As stated previously, Verizon VA's planning data concerning

busy hour usage on integrated lines indicates usage generally higher than usage on analog lines.

Q. Are AT&T/WorldCom correct in stating that their assumption of 4:1 GR-303 line concentration is "extremely conservative?"

[AT&T/WorldCom Rebuttal Panel at 31.]

A. No. Since IDLC remote terminals are much more likely to serve higher usage business customers, Verizon VA considers 3:1 line concentration reasonable. In actual design, if this ratio is arbitrarily set higher than 3:1, Verizon VA's higher usage customers could experience blocking. AT&T/WorldCom offer no evidence in support of a 4:1 line concentration ratio, or for that matter any evidence that they have any actual experience using GR-303 technology to serve their own customers. AT&T/WorldCom's unsupported claim that a 4:1 concentration ratio is "extremely conservative" should be rejected.

Q. Are AT&T/WorldCom correct that a 3:1 line concentration is the minimum concentration possible on the Litespan GR-303 system?

[AT&T/WorldCom Rebuttal Panel at 30-31.]

A. No. A 1:1 concentration, *i.e.*, zero concentration, is possible in a GR-303 Litespan system.

C. VERIZON VA ACCURATELY ACCOUNTS FOR UTILIZATION IN SCIS AND VCOST

Q. Please explain how Verizon VA calculated port utilizations and how they were used in the switching studies.

A. Verizon VA's cost studies account for an overall forward-looking port utilization, based on the type of equipment being studied — *e.g.,* IDLC ports or digital trunk ports. Each of these utilizations are adjusted *upwards* to account for SCIS administrative fill and SCIS breakage, as described in Verizon VA Initial Panel Testimony.[150/]

Specifically, SCIS has an input for the administrative fill for lines and trunks. These inputs pertain to the number of lines/trunks utilized versus the number of lines/trunks used for administrative spare. Administrative spare is necessary for all components of the network to accommodate customer inward/outward movement, maintenance requirements, and the technical and physical nature of the design of the particular plant and equipment. When SCIS builds the switch to meet these requirements, it adds additional equipment "breakage," to reflect that the last frame of equipment is not usually filled to full capacity. This "breakage" can be used to meet future demand.

Q. Do you agree with AT&T/WorldCom's claim that Verizon VA inappropriately accounts for port utilization twice by entering the

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150/ VZ-VA Direct Panel at 196-197.

utilization into SCIS and also making utilization adjustments to VCost? [AT&T/WorldCom Rebuttal Panel at 107-08.]

A. No. AT&T/WorldCom misunderstand Verizon VA's cost studies. Verizon VA correctly accounts for utilization in both SCIS and VCost because SCIS does not fully reflect Verizon VA's forward-looking utilization assumptions.

For example, Verizon VA assumed **[BEGIN VERIZON PROPRIETARY] [END VERIZON PROPRIETARY]** utilization rate for analog line ports. Inputting an administrative fill of 95% into SCIS alone would yield an unreasonably high utilization rate greater than **[BEGIN VERIZON PROPRIETARY] [END VERIZON PROPRIETARY]**, with SCIS breakage. Thus, Verizon VA must enter a utilization of **[BEGIN VERIZON PROPRIETARY] [END VERIZON PROPRIETARY]** in VCost to reduce the overall utilization rate to **[BEGIN VERIZON PROPRIETARY] [END VERIZON PROPRIETARY]**.[151/]

[151/] Although AT&T/WorldCom criticize Verizon VA's proposed utilization rate, WorldCom itself suggests with respect to the provisioning of trunks between it and Verizon VA that a 15% utilization rate should be the minimum, and when utilization reaches 80% or more, relief capacity must be provisioned. *See* Greico Direct at 3.

Importantly, VCost utilization had been properly adjusted *upwards* to account for the administrative fill and breakage entered in SCIS.[152/] Setting the utilization to 1.0 in VCost, as AT&T/WorldCom propose, would understate costs, since utilization is not fully accounted for in the SCIS inputs.

D. VERIZON VA APPLIED THE APPROPRIATE DISCOUNT TO FEATURE PORT ADDITIVES AND HAS FULLY SUPPORTED ITS FEATURE COSTS

Q. What is a feature port additive?

A. A feature port additive reflects the additional hardware costs that Verizon VA incurs to provide certain switching features to CLECs — *e.g.*, three-way calling, which requires a three port conference circuit. Verizon VA uses the SCIS/IN model to calculate these investments.

Q. Should Verizon VA use a replacement only discount in calculating feature port additive costs, as AT&T/WorldCom claim? [AT&T/WorldCom Rebuttal Panel at 109.]

A. No. For the reasons discussed above, AT&T/WorldCom's claims regarding replacement-only discounts are incorrect. The effective discount that Verizon VA actually receives should be the basis of forward-looking switching costs. However, if this Commission decides to adjust Verizon VA's switching discount in SCIS/MO in any way, the same

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[152/] *See* Attachment R. This spreadsheet, as filed in Verizon VA's cost studies, had minor errors. It has been corrected.

adjustment should be made to the discount in SCIS/IN. Verizon VA's effective discount is appropriate to all switching investments, including those associated with features.

Q. Please respond to AT&T/WorldCom's claim that Verizon VA's input value for "screen list editing" is inflated. [AT&T/WorldCom Rebuttal Panel at 109-110.]

A. The SCIS/IN inputs require estimating usage characteristics for each feature that represent all customer usage of the particular feature. The majority of the feature usage characteristics do not affect the cost dramatically.

In an effort to undermine all the feature usage inputs, AT&T/WorldCom criticize and single out one particular feature input, Screen List Editing (SLE), which is required for several features. Specifically, AT&T/WorldCom question why Verizon VA assigned an SLE input of 200 lines per office for Distinctive Ringing, while three other features[153/] use an SLE input of 750 lines per office. It is certainly reasonable to expect different features to have different quantities of users per office with different calling characteristics. The estimates used in Verizon VA's study are based on the judgment of the product manager,

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153/ Selective Call Rejection, Selective Call Acceptance, and Selective Call Forwarding.

who is certainly more familiar with the use of these features than AT&T/WorldCom's witnesses.

Q. What is the significance of the SLE input with respect to the cost of Distinctive Ringing?

A. If Verizon VA increased the SLE for Distinctive Ringing from 200 to 750 lines per office (to match the other three features that use SLE), the monthly cost of Distinctive Ringing would go from $0.0044 to $0.0032. AT&T/WorldCom is making an issue of a SCIS/IN input of a feature whose cost is *less than a half a penny per month.*

Q. Please respond to AT&T/WorldCom's claim that Verizon VA has failed to support its feature costs. [AT&T/WorldCom Rebuttal Panel at 110.]

A. The estimates regarding feature usage (which drives feature costs) assumed in Verizon's studies are based on the judgment of the product manager, who has over 25 years experience and is by far the person most familiar with Verizon's customer feature usage. Verizon believes that all the various feature inputs used fall within reasonable ranges.

Notably, AT&T/WorldCom have offered no evidence that Verizon's inputs do not represent actual feature usage, despite the fact that AT&T/WorldCom both own numerous switches and presumably can

obtain their own data rebutting Verizon VA's assumptions regarding feature usage if such data existed.

E. VERIZON VA ACCURATELY ALLOCATED SWITCHING COSTS ACCORDING TO TRAFFIC SENSITIVITY

Q. Please explain how Verizon VA determined which costs were traffic-sensitive and which costs were non-traffic-sensitive.

A. Verizon VA has assigned all the following SCIS investments to the ports: Line Termination A+B+D; Trunk CCS; BRI — U Card; PRI D Channel; and PRI B Channel. All other SCIS identified switching investments are considered usage-related and have been assigned appropriately to usage.

Q. Please respond to AT&T/WorldCom's statement that "[m]odern switching systems are typically designed to be traffic limited, rather than port limited. This design allows for the cost effective sharing of costly switch resources and strives to carefully balance service quality and the cost of associated switch infrastructure." [AT&T/WorldCom Rebuttal Panel at 24-25.]

A. Verizon VA agrees with the statement that modern switching equipment is traffic limited. AT&T/WorldCom appear to be conflicted on this issue, however, since this statement contradicts the panel's statement on page 111 of the rebuttal testimony that "digital switches are port-limited and are not constrained by peak period usage," as well as Ms. Pitts' direct

testimony.[154/] Apparently AT&T/WorldCom advocate one position in their attempt to have the Commission assume far more GR-303 than is realistic in Verizon VA's network, and a completely opposite position when necessary to underestimate Verizon VA's switching costs.

In any case, Verizon VA demonstrates in the rebuttal testimony of Mr. Murphy and the surrebuttal testimony of Telcordia witness David Garfield that port exhaustion is only one factor that contributes to switch capacity. As Verizon witnesses demonstrate, usage is by far the largest driver of switch capacity.

Q. Do AT&T/WorldCom properly define fixed and variable costs?

A. No. AT&T/WorldCom's use of the terms fixed and variable costs is misleading. The notion that only variable costs should be assigned to usage while fixed costs should be assigned to ports is incorrect. The real question to ask when assigning costs between usage and the port is: What switch resources are dedicated to one user, and what resources are shared among all users? Dedicated resources should be recovered by the particular user dedicated to that resource (such as a port or trunk). Shared resources should be recovered by each user sharing those resources in a fair and reasonable manner (such as a per-minute-of-use charge).

[154/] *See* Pitts Direct at 7.

Q. Do Verizon VA's cost studies correctly allocate switch resources in that manner?

A. Yes. Verizon VA utilizes the Telcordia-developed model SCIS to ensure that investments (switch resources) are accurately and appropriately identified. Unit investment associated with the port (both trunk and line) is identified by SCIS in the manner described in this panel's direct testimony. All other SCIS-identified investments are considered shared and are assigned to usage.

Q. Do you agree with AT&T/WorldCom's claim that "getting started" costs do not vary according to the line and traffic inputs into SCIS, and that "getting started" costs are not traffic-sensitive? [AT&T/WorldCom Rebuttal Panel at 112.]

A. No. As Mr. Garfield explains in his surrebuttal testimony, "getting started" costs are driven by usage and should therefore be recovered on a usage basis.

Q. Please comment on AT&T/WorldCom's claim that, because Verizon VA excluded "getting started" costs from its reciprocal compensation rates, it has conceded that these costs are non-traffic-sensitive. [AT&T/WorldCom Rebuttal Panel at 122.]

A. AT&T/WorldCom attempt to confuse the issue. Verizon did not include "getting started" costs anywhere in its reciprocal compensation studies

because these are not additional costs associated with terminating traffic. Thus, Verizon's exclusion of these costs from the reciprocal compensation studies has nothing to do with whether or not they are traffic-sensitive.

Q. Do you agree with AT&T/WorldCom's claim that line termination costs should be categorized as non-traffic-sensitive? [AT&T/WorldCom Rebuttal Panel at 113.]

A. Yes, Verizon VA agrees that line termination costs should be categorized as non-traffic-sensitive, because this is a dedicated resource.

Q. Do you agree that BRI and PRI costs should be categorized as non-traffic-sensitive? [AT&T/WorldCom Rebuttal Panel at 113.]

A. Yes, BRI and PRI port costs should be categorized as non-traffic-sensitive, because they are dedicated to single end users.

Q. Do you agree that other ISDN-related port costs should be categorized as non-traffic-sensitive? [AT&T/WorldCom Rebuttal Panel at 113.]

A. Yes, Verizon VA agrees that other ISDN-related port costs should be categorized as non-traffic-sensitive, because these resources are not shared among end users.

Q. Do you agree that EPHC costs should be assigned to the ports? [AT&T/WorldCom Rebuttal Panel at 114.]

A. No. Verizon VA agrees with the surrebuttal testimony filed by Mr. Garfield, which explains that EPHC costs are usage sensitive.

Q. Do you agree with AT&T/WorldCom's claim that Line CCS categories, D Channel Access PPS, PPB Channel Access PPS, Inter-Switch PPS, and SS7 link costs should all be assigned to the traffic-sensitive category? [AT&T/WorldCom Rebuttal Panel at 114.]

A. Yes, and Verizon VA's cost studies appropriately assign these costs to usage.

Q. Do you agree with AT&T/WorldCom's claim that trunk costs are traffic-sensitive and should be assigned to the common trunk MOU rate element? [AT&T/WorldCom Rebuttal Panel at 114.]

A. Yes, Verizon VA believes that trunk costs are traffic-sensitive and must be recovered on an MOU basis.

Q. Please summarize the percentage of switching costs that Verizon VA has categorized as traffic-sensitive and non-traffic-sensitive.

A. Verizon VA's switching costs, as calculated in the switching cost studies, are 47.14% non-traffic-sensitive and 52.86% traffic-sensitive.

Q. Why is it important that the Commission properly allocate traffic and non-traffic-sensitive costs?

A. From a cost recovery standpoint, AT&T/WorldCom's proposal to allocate most of the switching costs to the port rate element, regardless of how much of the switch resources (*i.e.*, usage) each customer utilizes, contradicts basic cost-causation principles and could ultimately artificially drive up the actual level of usage, resulting in an under-recovery of switching investments for Verizon and congestion in Verizon's switching network.

Verizon is entitled to recover its costs, while the particular carrier may determine the type of customer behavior it wishes to encourage. Each carrier must establish rate structures that drive desired customer usage behavior. For example, charging customers for each minute they utilize the network drives good usage behavior. Lifting this charge would certainly have a negative impact on the network. This is exactly what occurred several years ago as the Internet took off. When Internet Service Providers (in particular, America Online ("AOL")) initially offered unlimited monthly usage, many people logged on their computers in the morning and never logged off, for fear that they might not be able get back onto the network because of limited modem facilities (*i.e.*, busy signals). It didn't take long for AOL to realize this and provide safeguards in their network to automatically log off users after ten minutes of inactivity.

In addition, as Mr. West explained in his rebuttal testimony, AT&T/WorldCom are proposing exactly what the Commission has always taken much care to avoid — having low-usage residential customers support high-usage business customers. Put simply, the cost causers should pay for the resources required by their demand.

F. VERIZON VA'S RTU PROPOSED FEES ARE FORWARD-LOOKING AND PROPERLY ALLOCATED AS TRAFFIC SENSITIVE

Q. What are right-to-use fees?

A. Right-to-use fees, or RTU, are fees associated with the use of vendor software.

Q. Did Verizon VA provide supporting documentation for its right-to-use fees?

A. Yes. Contrary to AT&T/WorldCom's claims,[155/] Verizon VA has fully documented the costs associated with right-to-use fees.[156/]

Q. AT&T/WorldCom note that the right-to-use fees in 1999 were significantly higher than in other years. [AT&T/WorldCom Rebuttal Panel at 116.] Please explain why.

A. The amortization of the RTU costs should properly include 1999. As explained in Verizon VA's direct testimony, the annual estimate of RTU is

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155/ *See* AT&T/WorldCom Rebuttal Panel at 116.

156/ VZ-VA CS Part G-9; VZ VA Panel Direct at 203.

based on the estimated amount Verizon VA will spend over a year on RTU for digital switching. Software expenditures can and do vary greatly year over year, and there is no reason to disregard an actual spike in expenditures in 1999. Certainly there may be vendor software developed in the near future that may cause another spike.

Verizon VA's methodology for estimating RTUs is extremely conservative, because the vast majority of Verizon VA's digital switching network is already deployed. The average cost per end office identified in Verizon VA's cost study is $118,238[157/] per year. This amount in no way captures the initial cost of the RTU necessary, in conjunction with the initial deployment of a digital switch. This amounts to approximately $1.18 million over the economic life of a switch. Although Verizon VA did not attempt to estimate the cost of the initial switch software packages, we know from previous UNE proceedings that it is in the realm of $2 million *per switch.*

In fact, the AT&T contract with Lucent indicates that the cost of upgrading generic 5E12 to 5E13 is $120,000 per switch.[158/] In addition,

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157/ *See* Attachment S.

158/ See AT&T Response to VZ-VA 1-1 and attached Contract No. LLJ288D, Exhibit 3(b), page 3. WorldCom has refused throughout this proceeding to provide this requested data, despite its relevance to evaluating Verizon VA's proposed costs. (Attachment A.)

the cost to AT&T for generic 5E12 is $2 million per new switch.[159/] The fact that the contract prices for Lucent's 5ESS software in AT&T's contract and Verizon VA's switching studies are virtually the same is not a coincidence. Verizon VA's switching RTUs are reasonable and forward-looking, and should be accepted.

Q. Please respond to AT&T/WorldCom's claim that Verizon VA's RTU expenditures improperly include costs to update older switches. [AT&T/WorldCom Rebuttal Panel at 116.]

A. AT&T/WorldCom apparently believe that Verizon VA's switching costs should assume that Verizon VA purchases a new switch every time new software is released. This assumption is, of course, absurd. Each of Verizon VA's switch vendors issues new generic releases of its software on a yearly basis. In fact, Nortel issues two releases per year. Each release contains new software features and operational/maintenance packages, in addition to enhancements to previously deployed packages. AT&T/WorldCom ignore the fact that companies must continually invest in new software in order to be able to provide the latest services with the highest level of efficiency. In fact, AT&T admits that it performs a generic upgrade on its Virginia switches approximately every year.[160/]

[159/] See *id.*, Exhibit 1, page 1, item 4.

[160/] AT&T Response to VZ-VA 1-2. Again, WorldCom has refused throughout this proceeding to provide this information with respect to its switches. (Attachment A.)

AT&T/WorldCom's claim should also be rejected for the reasons discussed above, and also rejected because of the testimony of Drs. Shelanski and Tardiff. Verizon VA will be using existing switches on a forward-looking basis and should therefore recover the RTU fees required to update these switches.

Q. Do you agree with AT&T/WorldCom's claim that RTU fees should be recovered on a non-traffic-sensitive basis — that is, through the port charge? [AT&T/WorldCom Rebuttal Panel at 117-18.]

A. No. AT&T/WorldCom mis-categorize the RTU costs in the same manner that they mis-categorize the "getting started," or processor, costs. RTU costs should be recovered so that a user who utilizes a larger share of resources should be required to pay a proportionally larger amount for those resources than a user that uses less of the resources.

The switch processor can be thought of in the same manner as any computer processor, which is virtually sitting idle until the user invokes software. For switching, this equates to a phone going off hook. At that time the processor starts to establish the call, it evokes various stored programs to establish and maintain the call, including any particular features the caller may utilize on their particular line. Callers utilizing the processor also utilize the software necessary to run the processor.

AT&T/WorldCom's proposal that these costs be recovered through the monthly port charge is nothing more than an attempt to force residential usage customer to subsidize the higher-usage business customers in Virginia. Their proposal to allocate the RTU costs to the port should be rejected.

G. VERIZON VA'S PROPOSED EF&I FACTOR IS REASONABLE

Q. Please explain how Verizon VA applies the EF&I factor in its switching studies, and how this factor is derived.

A. This factor is applied to the forward-looking digital switching investment within each study in order to approximate the costs associated with engineering, furnishing and installing the digital switching equipment. It is developed from Verizon's DCPR data, which reflects, among other things, the costs to install switching equipment throughout the Verizon footprint in 1998. This factor reflects the ratio of the "Total Cost Installed" investment of all equipment classified as digital switching equipment to the "Material Only" investment of the same equipment. The ratio therefore expresses the estimated cost to install digital switching equipment based on the relationship that existed in 1998.

This ratio is forward-looking because Verizon VA expects this same relationship to prevail in the foreseeable future.

Q. Is Verizon VA's DCPR reliable?

A. Yes. Contrary to AT&T/WorldCom's claims, Verizon VA's DCPR is reliable. As discussed above in the factors section of this testimony, this data is routinely used to develop costs and has been approved by this Commission.

Q. Do you agree with AT&T/WorldCom's claim that Verizon VA's EF&I factor is too high? [AT&T/WorldCom Rebuttal Panel at 119-20.]

A. No. AT&T/WorldCom provide no support for this claim. Indeed, AT&T/WorldCom install switches in their own network and therefore have data in their possession that they could use to rebut Verizon VA's factor. The fact that they chose not to do so is telling.

AT&T/WorldCom also appear not to understand how EF&I factors are calculated. AT&T/WorldCom argue that Verizon VA's material investments for digital switches are too high. They ignore, however, the fact that there is an inverse relationship between the material price of switches and the level of an EF&I factor. The lower the switch material cost, the higher the EF&I factor will be.

For example, suppose the cost to engineer and install a switch is $100, and the material price of the switch is $400. The EF&I factor would be 25%. If the material price of the switch dropped to $200, then the EF&I factor (in order to yield the correct amount of $100) would jump up to 50%. AT&T/WorldCom's suggestion that Verizon VA use EF&I factors based on older data (ten years old) derived at a time when the material cost of digital switching investment was *higher* than in 1999 ignores this inverse relationship.

Q. Please respond to AT&T/WorldCom's claim that Verizon MA admitted that it performs its own engineering and installation of switching equipment and that this data is therefore unreliable. [AT&T/WorldCom Rebuttal Panel at 120.]

A. Where Verizon performs its own engineering and installation work, it has every incentive to perform this work efficiently, since inefficiency would increase labor and other associated costs.

Moreover, Verizon VA competitively bids this type of work to outside vendors in many of the Verizon jurisdictions. Because Verizon's EF&I factors are based on all of the jurisdictions within the Verizon – East footprint, the EF&I factors reflect these competitively bid vendor jobs.

Q. AT&T/WorldCom suggest that a reasonable EF&I factor for digital switches would be about 60% of the factor that Verizon VA has used. [AT&T/WorldCom Rebuttal Panel at 120-21.] What, if anything, is wrong with their calculation?

A. AT&T/WorldCom's proposed 27% EF&I factor uses EF&I factors based on entirely different switch investment calculations and seeks to simply apply them to totally unrelated switch investment amounts. As explained in the Panel Direct testimony, if the investment used in calculating an EF&I factor changes significantly, the EF&I would have to be restated in order to capture the actual EF&I expenses, because installation costs, for example, do not vary with investment amounts in a linear fashion. A door that costs 10% less than a different door will not necessarily cost 10% less to install — indeed, the installation cost might not vary at all.

Ignoring this principle entirely, AT&T/WorldCom simply average an 11% factor they take from a 1992 filing Verizon made with the FCC with a 12% factor (plus sales tax) they calculate from the SCIS model. They thus seek to combine a factor based on investment levels that are nearly ten years old with a factor based on current investment level — and suggest that this could in some manner produce a meaningful "average" EF&I factor. Not only is the 1992 investment level no doubt entirely different from the level used as a SCIS input — but, given the vintage, it also likely is based on different plant, using older installation techniques

that are no longer relevant. As noted above, although AT&T/WorldCom question whether Verizon VA's 1998 EF&I costs can still be relevant in 2001, they advocate using a factor based on data nearly 10 years old which *certainly* cannot be relevant. In sum, AT&T/WorldCom's basis for reducing the switch EF&I is so absurd and insupportable that it merits no consideration whatsoever.

Q. In support of their proposed reduction of the digital switch EF&I factor, AT&T/WorldCom claim that other telephone companies averaged 10% for an EF&I factor in the 1992 FCC Open Network Architecture filings. [AT&T/WorldCom Rebuttal Panel at 120 n. 110.] Is this comparison valid?

A. No. As noted above, an EF&I factor based on 1992 data — or more likely data from even earlier — almost certainly uses a different switch investment assumption than that which would be used today, and the processes for engineering, furnishing and installing switches no doubt has changed dramatically since 1992 or before. Given both of these considerable drawbacks, AT&T/WorldCom would have to provide a compelling basis to believe that this 1992 EF&I factor is in any way relevant to Verizon VA's proposed switch EF&I. Instead, they provide no data whatsoever with respect to the calculation of that factor.

Q. What about the 8% EF&I factor that AT&T/WorldCom cite from the FCC's USF proceeding? [AT&T/WorldCom Rebuttal Panel at 120 n. 110.]

A. Though AT&T/WorldCom cite this factor, the 8% factor in that proceeding covers only engineering costs, not the furnishing and installation costs that are included in Verizon's EF&I factor.[161/] Moreover, as explained in Verizon VA's rebuttal testimony, the USF proceeding is designed to capture different costs based on different assumptions, and it is not LEC-specific, but instead seeks to capture national averages.

Finally, the 8% EF&I factor that AT&T/WorldCom cite was calculated from data provided by rural telephone companies for 181 digital switches installed in 1995 and 1996. AT&T/WorldCom cannot identify these rural telephone companies, but it is fair to assume that these unnamed companies could not possibly have commanded as high a percentage discount on switch purchases as Verizon can attain. Thus, the investment denominator in the factor is itself not comparable to that used by Verizon VA. Moreover, while not as old as the 1992 data AT&T/WorldCom rely on elsewhere, the 1995 and 1996 EF&I expenses are likely to reflect different processes than those used today, at least to

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[161/] See *Comments of Sprint Corporation*, CC Docket 96-45; 97-160 at 45 (July 23, 1999) (noting that the 8% addition is designed "to cover LEC *Engineering* costs") (emphasis added).

some degree. This renders any comparison of Verizon VA's factors and those of the rural telephone companies useless.

Q. AT&T/WorldCom state that Verizon's "response to AT&T Data Request Number 9, Request 31 seeking detailed DCPR data supporting Verizon's claimed EF&I factor provided only a column called 'installed investment' without any data that underlie the installation costs." They then use this claim of "incomplete documentation" to support the use of an earlier factor supplied in 1992. Are they correct, and is this appropriate? [AT&T/WorldCom Rebuttal Panel at 119.]

A. Absolutely not. A CD containing detailed information was provided with Verizon VA's response to that AT&T data request. That CD contained data from all 13 Verizon East jurisdictions with nearly 8,500 entries of information for Virginia alone (and comparable numbers from the other jurisdictions), and included the central office building, floor and frame location, equipment codes, equipment descriptions, manufacturer part numbers, material cost and in-place cost. Thus it is difficult to credit AT&T/WorldCom's claim that the absence of complete documentation requires use of the proposed AT&T/WorldCom factor.